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Density of Matter

Abstract

This Universe already knows everything about this Universe. The size and composition of every particle was decided long ago at the birth of this Universe. We are grasping. Our goal is to justify ideas. Accuracy is important but we are looking for plausible solutions.

To simplify the task on hand, we suppose that every particle in our Universe is made from the same Matter. We reduced our estimate of the density of this matter to a reasonable value of 2.0E+06 kg/m^3.

The density of matter per Wikipedia is ~3.0E+17 kg/m^3. This number is based on the Bohr atom. The Bohr atom does not exist. Electrons do not orbit Nucleons for a very simple reason: their energy could not be replenished by an energy source. The Nucleons of the Atom determine the size of the Atom. The Atom is surrounded by high energy Ether, to hold it together with pressure.

Wikipedia is a Goldmine of Information

We found six numbers of interest:

Avogadro constant: N_A = 6.02214076E+23 mol^{-1}
Mass of Proton: 1.6726E-27 kg
Mass of Neutron: 1.6749E-27 kg
Mass of Electron: 9.1094E-31 kg
Density of Nucleons: ~3.0E+17 kg/m^3
Density of Neutron Stars: ~3.7E+17 to 5.9E+17 kg/m^3

Wikipedia is mum about the size of Protons, Neutrons and Electrons
In the Standard Model the sizes are undetermined.

In the Kinetic Model of the Universe, Atoms and Molecules are immersed in a sea of Ether. The pressure exerted by Ether in our estimation is one to two terapascal. Ether pressure holds Atoms together.

In a Neutron Star – if it exists – Ether is squeezed out and Atoms fall apart to their constituent Nucleons. A Neutron Star is like a giant Atom held together by the surrounding Ether. Densely packed round balls in tetrahedron configuration fill about 78% of the space with spaces left between the balls. Balls may deform into other shapes to occupy all space if the balls are pliable.

1 mole of C12 = 12 grams = 6.02214E+23 Atoms = 7.22657E+24 Nucleons
Mass of Nucleon = 1.66E-27 kg

There are 1E+28 to 1.75E+29 $Atoms/m^3$ in most solids
Highest density of Atoms is for Diamond 1.75E+29 $Atoms/m^3$
Density of Nucleons for Diamond is 2.1E+30 $Nucleons/m^3$
Linear packing density for Diamond ~5.15E+09 Atoms/m
Linear packing distance ~ 1.94E-10 m/Atom

Density of Matter

The density numbers listed on Wikipedia for Nucleons and Neutron Stars are between 2.0E+17 kg/m^3 and 3.0E+17 kg/m^3. These numbers are excessive. Here are our realistic numbers:

Item	Density
Diamond	3.515E+03 kg/m^3
Earth – mean density	5.514E+03 kg/m^3
Nickel	8.908E+03 kg/m^3
Osmium	2.259E+04 kg/m^3
Center of Sun (modeled)	1.622E+05 kg/m^3
Our best estimate for Matter	2.000E+06 kg/m^3

Table 1. Selected Density Numbers

We know the mass of Atoms and we know the approximate packing density of Atoms, the number of Atoms in a volume of most Matter. From electron-microscope images, we can guess the ratio of distance between Atoms to diameter of Atoms is about 2 to 6.

For smaller matter density, Atoms would have larger diameters but the distance between Atoms stays the same. Space not occupied by Atoms is occupied by Ether.

We calculated data for Diamond, Nickel, Gold, and Osmium at three Matter Density.

Packing Ratio = Distance between Atoms / Diameter of Atoms.

Density of	1.0E+06 kg/m^3		2.0E+06 kg/m^3		1.0E+07 kg/m^3	
Matter	Atom Dia. m	Pack. Ratio	Atom Dia. m	Pack. Ratio	Atom Dia. m	Pack. Ratio
Diamond	3.73E-11	5.8	2.68E-11	7.3	1.57E-11	12.4
Nickel	5.73E-11	4.2	4.55E-11	5.3	2.67E-11	9.1
Gold	8.57E-11	3.3	6.80E-11	4.1	3.98E-11	7.0
Osmium	8.47E-11	1.9	6.72E-11	3.9	2.93E-11	6.7

Table 2, Packing Ratio

Osmium Atoms are not the largest/heaviest Atoms, but they are packed densest. Osmium is the heaviest Element, at 22,590 kg/m^3, followed by Iridium, Platinum,

Size and Mass of Ethon, Electron, Nucleon

We copied the Mass of Nucleons and Electrons from Wikipedia. We have decided on a reasonable number for matter density: 2.0E+06 kg/m^3. From density we calculate size. We lack any information of individual Ethon size and mass. We decided on a geometric progression of Diameters

In Table Form:

*Reserved for possible future use

	Ethon	Other*	Electron	Nucleon	Units
Mass	2.696E-37	4.956E-34	9.109E-31	1.674E-27	kg
Mass Ratio	1	1838	3.378E+06	6.209E+09	Ethon
Mass Ratio		1	1838	3.378E+06	Other
Mass Ratio			1	1838	Electron
Diameter	6.363E-15	7.794E-14	9.548E-13	1.169E-11	m
Dia. Ratio	1	12.25	150	1838	Ethon
Dia. Ratio		1	12.25	150	Other
Dia. Ratio			1	12.25	Electron

Table 3, Mass and Size of Particles

Density of Ether	2E-05	kg/m^3
Mass of Ethon	2.696E-37	kg
Number of Ethons / m^3	7.418E+31	Each/m^3

Velocity gain from collision with Ethon

Velocity gain by Electron ~ 2×Am×v / Em = 9E+08 / 3,378E+06 = 266.4 m/s
Velocity gain by Nucleon ~ 2×Am×v / Nm = 9E+08 / 6.209E+09 = 0.145 m/s
Velocity gain by Carbon Atom ~ 0.012 m/s

You results may be different. The possibilities are endless.

Preliminary Ether Data

Ether is a monatomic super-gas consisting of tiny balls of matter we call Ethons that fills every part of the Universe.

Imagine Helium Atoms under high pressure in a giant balloon, but three orders of magnitude smaller.

Density of Ether	20 mg / m^3
Pressure of Ether	1 terapascal
Average velocity of Ethons	1.5 c m/s
Mass of individual Ethons	2.696E-37 kg
Mass of Electron	9.109E-31 kg
Mass of Nucleon	1.674E-27 kg